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The CDAA Framework for Development of Sustainable Large-scale Smallholder Irrigation Schemes in Swaziland

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Abstract

Poverty affects nearly a billion of the world population and many of these people are living in rural communities. Smallholder irrigation development plays a pivotal role in reducing rural poverty. Many smallholder schemes have failed in the past due to poor planning and community disputes. This paper presents a promising framework, the CDAA, for developing sustainable smallholder irrigation schemes which is currently applied in the LUSIP project in Swaziland. The strength of the framework is that; 1) it makes the primary beneficiary (community) the main driver of the development, and 2) it significantly changes the economic state of the community.

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Keywords: Development framework; irrigation development; smallholder irrigation; sugarcane

1. Introduction

Irrigation has been practiced for many years through the necessity to maximize food supply for humanity. The last century has witnessed intensive irrigation development projects on a global scale with irrigation becoming the principal water user, accounting for about 80% of total water use (Shiklomanov, 1993). In fact, irrigation development has been identified as an alternative in resolving many developing countries' present food crisis by providing better water control which, consequently results to significant increase in agricultural production and

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improved rural livelihoods (Biswas, 1986). The promotion of smallholder irrigation development in Africa dates as far back since the 1930s as a means of ensuring food security as well as improving the standard of living of rural people (Hillel 1997). Many studies in the research literature describe how irrigation development has contributed in the improvement of the welfare of several communities in the world. This is because a significant proportion of the economy for the developing world is dependent on irrigated agriculture (Downing et al., 1997). The study of Hasnip et al. (2001) on the contribution of irrigation to sustaining rural livelihoods showed that irrigation can play a central and dynamic role in the improvement of rural livelihoods. Eneyew et al. (2014) in their study of the role of small-scale irrigation in poverty reduction in Ethopia observed that irrigation development improved household income and contributed to poverty reduction. Van Averbeke and Mohamed (2006) in their study on the history of smallholder irrigation schemes in South Africa, identified endogenous development innovations that can improve the economic performance of smallholder irrigation schemes. In Swaziland, smallholder irrigation schemes were established with the help of the government to raise smallholder incomes by integrating them into the existing dynamic commercial market-oriented environment (Lankford, 2001).

2. The need for development framework of smallholder irrigation schemes

Although their role in improving the livelihoods of many farming families in African communities are commendable, smallholder irrigation schemes development have had limited progress in many countries. In many cases, this has been caused partly by lack of technical expertise, poor planning and management, poor operation and maintenance, technical complexities, poor infrastructure, limited knowledge of crop production among smallholders and lack of reliable markets and effective credit services (Biswas, 1986; Mwendera and Chilonda, 2013). A study by Inocencio et al. (2005) analyzed about 314 irrigation projects implemented in 50 countries in Africa, Asia, and Latin America funded by the World Bank, African Development Bank and the International Fund for Agriculture Development (IFAD). The study showed that failures of past irrigation projects is one of the main reasons for the reluctance of financial and development agencies in investing more resources in irrigation. Another prominent factor that has constrained the economic success of smallholder farmers is the social conflicts seen on many irrigation schemes which has stalled progress and jeopardize sustainability of such schemes. Before considering the potential for further expansion of the area under irrigation by community-based smallholder sector, it is important to acknowledge that social conflicts among community members and local authorities can significantly affect progress and threaten sustainability of smallholder development. Several studies have documented the benefits of irrigation in community development. However, frameworks that integrate both traditional and modern approaches to community development are not popular. Project development financiers now need greater levels of assurance that community-based irrigation development projects will have less risk of failure due to social conflicts.

The purpose of this paper therefore is to present a framework for a successful implementation of large-scale smallholder irrigation development project with minimal social conflicts. The main motivation for developing this framework comes in light of the fact that the Southern Africa region has recently had considerable investment expended on a number of small-scale irrigation schemes in order to extend their participation in the expanding sugar industry within the region. This framework has been developed following a period of ten years in which the authors were engaged in two large-scale smallholder irrigation projects in the Kingdom of Swaziland. This framework shows the role that traditional authorities, project implementers and community participation play in rural irrigation development in an attempt to minimize project failure due to technical and social reasons. The Community Development Appraisal and Action (CDAA) framework used by LUSIP has several strengths addressing the threats and sustainability concerns presented above. The CDAA framework raises local consciousness and confidence, encourages bottom up planning and decision making for development, and promotes collaboration among communities. These strengths have made the LUSIP project attract attention in several governments of African countries (including South Africa, Mozambique, Malawi, Zimbabwe, Zambia and Seychelles) with its humongous success. In less than ten years of implementation it has achieved the following; improved equitable access to water and land for more than 15 000 rural residents in what was the poorest area of the country; has been implemented in six chiefdoms with an area of 3,370 hectares under irrigation; has benefitted about 20,479 community people from the project area; has increased average household income to $121.8 per month; and 2029 households with access to clean water supply.

3. Brief country background information

The Kingdom of Swaziland is located in Southern Africa, landlocked by the Republic of Mozambique to the east and the Republic of South Africa on all other sides, and has a total area of 17 360 km^2. The country's population (2004) is estimated at slightly more than 1.1 million, of which 76% live in rural areas (FAO/WFP, 2005). Overall, Swaziland has a subtropical climate with summer rains and the national long-term average rainfall is 788 mm/year. The recurring drought occurrences of the past and current times has only increased the number of people living below the poverty line of SZL 128 per month from 66% in 1996 to 69% in 2001 (EuropeanUnion, 2009). The Gross Domestic Products (GDP) growth rate in 2005 improved to 2.3% from 2.1% the previous year, but it was still lower than 2003 (2.9%) (EuropeanUnion, 2009). The main economic sectors are industry (mainly agro-industry), which accounts for half of the gross domestic product (GDP), and services, accounting for 34 percent of the GDP (FAO, 2008). The agricultural sector covers sugar, citrus fruit, maize, cotton, forestry, livestock and others. Sugar production is one of the key agriculture subsector which alone, contributes about 18 percent to the country's GDP, and about 10 percent of export earnings (EuropeanUnion, 2009).

4. Background on smallholder development in Swaziland

In many African countries, agriculture forms the backbone of the economy and this is true with Swaziland. In Swaziland, the sugar industry is the most important segment of the agricultural sector and has been for a long time enjoying the guarantee of preferential export markets which are negotiated under a number of protocol agreements (Matsebula, 2003). Sugar production dates as far back the mid-1950s in the country, with the establishment of the three sugar mills (Carr, 1987). Most cultivation is located in the Lowveld region of the country which has favorable climatic conditions and suitable soils. Sugar production in Swaziland is not possible without irrigation. As a consequence, the majority of water abstracted for agriculture (96%) in Swaziland is used for sugarcane production Matondo et al. (2005).

Since its inception, the industry has been dominated by large commercial estates and expatriate private farmers. In 1999, the government of Swaziland established a 25-year National Development Strategy (NDS) to guide the formulation of development plans designed to eradicate poverty, create employment, and achieve gender equity, social integration and environmental protection. The NDS identified a set of priorities, including the shift of smallholder farmers from rain-fed subsistence farming to irrigation-based commercial agricultural production (FAO, 2008; Swaziland, 1999). In line with the NDS, government has implemented two major water irrigation projects, the Komati Downstream Development Project (KDDP) and the Lower Usuthu Smallholder Irrigation Project (LUSIP), in one of the driest and poorest areas of the country (the Lowveld). The aim of these projects is to provide irrigation to 18 500 ha of land, helping local smallholder farmers to shift from a subsistence agricultural system to cash-crop production, mainly sugarcane. Since then, there has been a big increase in the area under smallholder cane production in the last fourteen years; it represents 23% of the supply to the two northern mills and 18% in the south. Most growers are organised in smallholder farmer's associations (RDMU, 2009). These are first major government-driven irrigation projects established in the country which led to the development of a significant number of smallholder irrigation schemes in the country.

The KDDP, which started in 2000 is supporting smallholder farms on 6,000 hectares, and is largely financed by the African Development Bank (AfDB). In the south, the European Commission and other major donors are financing the Lower Usuthu Smallholder Irrigation Project (LUSIP), which upon completion will provide over 3,000 households with irrigation on 12,500 hectares. It is envisaged that these schemes will alleviate poverty in the rural areas and enhance the national economy. The CDAA framework is used as a model for development. In the Swaziland sugar industry sustainability of the small-scale sugarcane farms is key for the sustainability of the overall sugar industry. This is mainly due to the fact that the expansion of the sugar industry over the last 10 years is mostly attributed to the entry of smallholder sugarcane growers. A study by Domleo (2002) highlighted key range of criteria for the sustainability of smallholder growers in the sugar industry, summarized as; 1) access to land; 2) access to market; 3) access to loan finance; 4) financial viability; 5) commitment and managerial skills.

5. Description of the study area

The study area is the Lower Usuthu Smallholder Irrigation Project (LUSIP), situated in Siphofaneni, one of the poorest areas of the country in the southern Lowveld at 26° 45' 10.86" South, and 31° 41' 49.43" East, located along the south bank of the Lower Usuthu River and composed of eight chiefdoms with a population of 22,000 people. The potential area being developed is approximately 12 500ha with 3,370 ha planted with sugar by smallholders. Irrigation water is conveyed from the Usuthu River to the Lubovane Reservoir where it is drawn by a main canal and distributed to irrigation schemes through the tertiary water distribution system. The land development process for farmers is facilitated by the Swaziland Water and Agricultural Development Enterprise (SWADE), a parastatal organization which assists communities to transform into businesses using the CDAA framework. The parastatal is organized into project implementation units as presented in Fig. 1 and these include, 1) Institutional Development, 2) Environmental and Sustenance, 3) Water management and engineering and 4) Agricultural Development. The project is funded by several donors for the various project components including the European Union, IFAD, ADB, BADEA, EIB, ICDF, DBSA, IFAD, USAID.

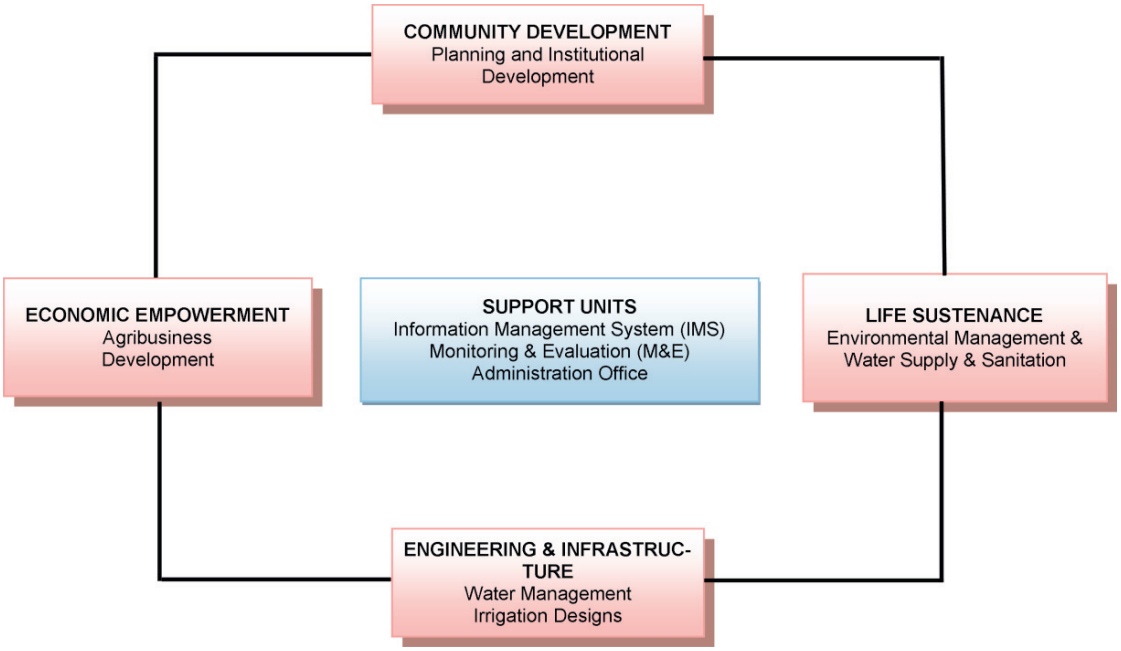

Fig. 1. Project management implementation structure in the LUSIP project.

6. The CDAA development framework

The CDAA framework was motivated by the fact that the primary beneficiary (community) is the main actor. This model has proved to include attitude change since the primary beneficiary is the main driver of the entire development. Interesting attributes of the framework are that it is transformational, builds competence (technical and leadership skills transfer), facilitates economic empowerment, and creates links with stakeholders and markets. The framework is based on an integrated approach that allows all the components to contribute to defining the overall methodology for sustainable development and operation of a large-scale smallholder irrigation scheme. The linkages between the different components are indicated in the framework in Fig. 2. The framework is divided into three interlinked phases, namely, 1) Attitude transformational, 2) Competence building and 3) Application phase. These

three phases are fundamental in the sustainable development of community-based smallholder irrigation schemes, and are implemented in the same order.

Most development work done in African countries especially by non-governmental organizations, were not guided by development frameworks that take into account the community aspirations. Most communal projects were done in emergence response to the acute state of poverty. One popular development framework used in the African region is called Learning through Evaluation, Accountability and Planning (LEAP). It was developed after realizing that a number of implemented income generation communal projects were not successful (World Vision Centre, 2006). This is a very successful development framework implemented by World Vision in 75% of rural communities in Swaziland. However, the limitation with the LEAP framework is that the economic state of the communities does not significantly change, but the framework is very good in rolling out relief programmes and generation of good reports, hence the donor confidence is guaranteed. The CDAA framework has attracted the highest communal development finance because its focus is on establishment of businesses and capital projects. It is no surprise LUSIP has access to funding for capital projects from official development assistance (Africa Platform for Development, 2010). The CDAA was established with the aim of transforming the food aid beneficiaries to be shareholders of agricultural irrigation schemes. The philosophy around the development of the CDAA framework was adapted from the threefold poverty crisis the world is suffering from (poverty, environmental destruction, and social disintegration) as presented by (Korten, 1990). Korten (1990) believed that any good development must sustain and nurture environment. Consistent with CDAA aspirations, Korten's influence was also that people should themselves decide what the improvements are and how they are to be created. The framework was further influenced by Korten to define poverty as shortage of skills and local inertia, failure of social and cultural systems, and finally an inadequate mobilizing vision. These four generations of development strategy have made CDAA to move from responding to symptoms (relief) to addressing underlying causes of poverty. The framework was built on the truth that the income derived from paid work is then a key indicator of a person's economic and social worth (Kerbo, 2006).

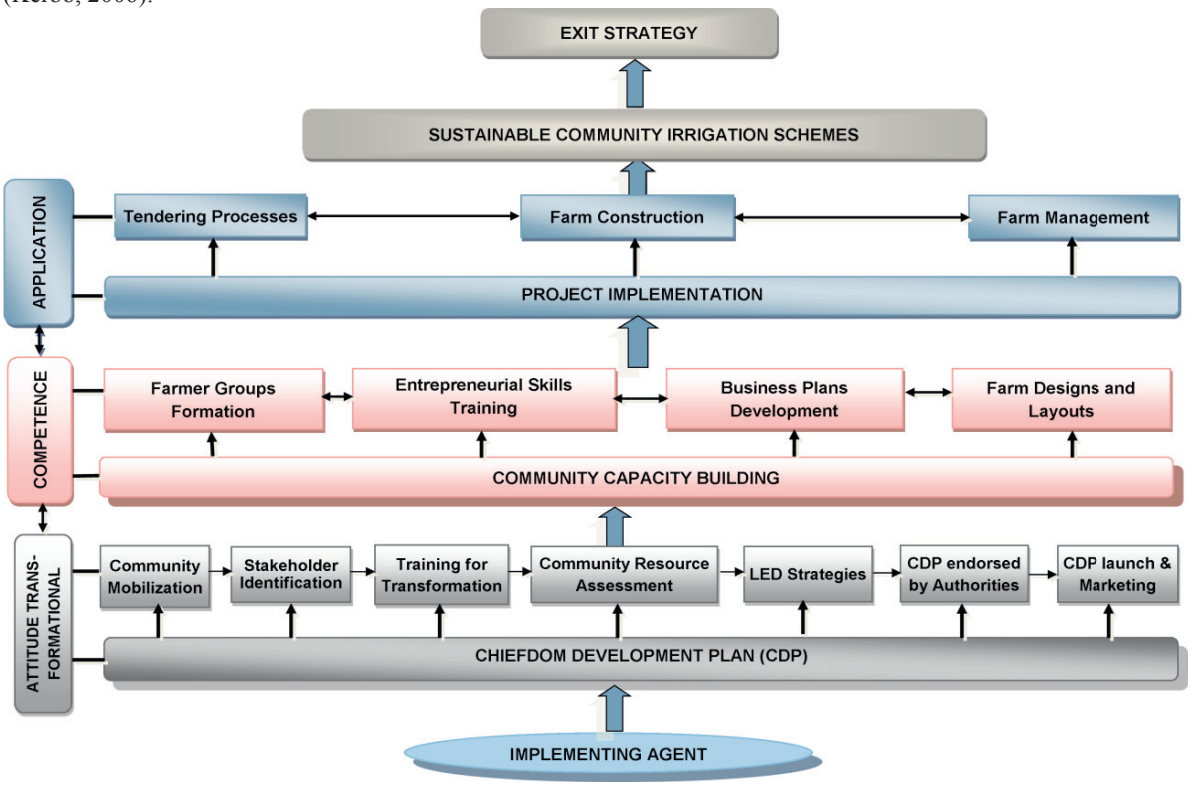

Fig. 2. The ACA development framework.

6.1. Attitude transformational phase

Successful development of sustainable smallholder farmers is based on the process of chiefdom development plan (CDP). The CDP is a tool for community planning. It involves a process for the identification and transformation of available community resources, especially land and water, into products for sustainable livelihoods of that particular community (Siwela, 2012). It is comprehensive in detailing how a particular community intends developing and it sets out targets and timelines for such intended development.

The CDP is the most single crucial process which the project had to adopt following the shortcomings and lessons learnt from the sister project, the KDDP. The CDP came about from the realization that development opportunities tend to elude the community because there is no framework within which they can be unearthed and taken advantage of. Even where development initiatives are implemented, they tend to be unsuccessful because there is no bigger vision to which they feed. The need therefore to plan and engage on the development direction which the chiefdom should take was realized. The CDP is thus a result of the engagements and discussions amongst the people in their different tiers from the community at large, to development committees, up to the traditional authorities and the Chief of the area. Leading activities at this stage include compiling an inventory of existing land use, land holdings and related issues; and identification of irrigation schemes, rainfed farming and livestock grazing areas and human settlements (IFAD, 2001).

The people draft a common chiefdom vision to ensure that everyone is moving in the same direction in their development aspirations. The vision is then sanctioned at traditional authority level with the local Chief also endorsing it as a future picture the chiefdom aspires to be. The CDP process also involves several stakeholders (including government, sugar millers, financiers, non-governmental organizations, local businesses and other organs of government such as the Department of Water Affairs) that are institutionally-linked and are identified during the process. According to the FAO (2001) a stakeholder is anyone who has a direct or indirect interest in, or is affected by, or can affect the outcome of irrigation development. A stakeholder approach to smallholder irrigation development requires an understanding of the needs of the community and recognition of the stake of all participants in achieving the success of the development. Strategic focus areas that would drive the chiefdom towards the attainment of the vision are identified such livestock development and management, environment management, public health, public security, disaster management, education and infrastructure development (SWADE, 2012b).

The main outcome of the CDP is the transformed community to share a common understanding of their jointly crafted vision. This component of the CDAA framework has given communities a chance to meditate and further engage on the purpose of improving their economic status (SWADE, 2012a). This has further made most farmer companies to train its shareholders on personal finance skills, motivated by the fact that economic empowerment without guiding purpose can harm the beneficiaries through indulging weird and costly life style.

6.2. The competence building phase

Competence building is the next phase in the development framework which aims to provide capacity to the smallholder farmers. In fact, the CDP becomes an important document in identifying the literacy level and incompetence among the community people through the profiling process that is carried out during the CDP process. According to Sishuta (2006) the viability and sustainability of a small-scale irrigation scheme demand a comprehensive package of interventions that address various issues of markets and marketing, capital investment and access to finance, technology, education and training, support and extension services. Therefore in order to achieve sustainability of the small-scale sector, it is important that the farmers acquire skills in farming as a business. Thus, enterprise training as part of a rural extension package equips the smallholder farmers with the business skills to benefit from an increasingly commercialized agricultural environment.

Critical skills considered important in this phase include developing a farm plan document which include the kind of farming enterprises they wish to venture into, the type of irrigation systems suitable for their farms. The appropriateness of an irrigation system is based on many factors. Crosby et al. (2000) developed a comprehensive manual to be used by planners and designers as a guide for the planning and design of smallholder irrigation projects. The manual provides guidelines for participatory irrigation planning and the type of systems suitable for smallholder farms, although he that some irrigation systems, particularly micro irrigation systems may be a risky option to smallholders.

The farm plan also addresses environmental impact as a result of farming, and includes an undertaking to maintain the equipment and the land in good order. In order to ensure sustainable farm development, the farmers are assisted to develop an environmental management plan documents which is annexed in the business plan document in order to secure funds addressing environmental impacts at farm level. Other essential training include; financial control and management, record-keeping, computer literacy, project planning, keeping minutes, communication, conflict resolution, marketing and management, operation and maintenance and quality control. Such training help build the capacity required from these new entrepreneurs to analyze situations and chart ways to minimize the adverse impact of constraints on their businesses.

6.3. Implementation phase and on-going extension services

The last phase of the framework deals with application of all the knowledge and skills acquired from inception in order to implement the irrigation projects. On the basis of a bankable business plans, the farmers are taken to another level where they are assisted to implement their farm plans, mainly in the procurement and installation of the irrigation equipment, land preparation and farm management through the procurement process. The farmers are assisted to formulate, read and understand contracts. Tenders are prepared for the design, supply and installation of new irrigation systems. A contract supervision triangle composed of Contractor-SWADE-Farmer is formed to supervise the implementation of the irrigation/land development works and check contractors' conformity to contracts specifications. As part of contract management practice, provide the Contracting Authority with certification of the works contracts, specifying whether evidence exists that i) the tasks have been properly performed; and ii) the amounts claimed by the contractor(s) have actually and necessarily been incurred in accordance with the requirements of the contract (EuropeanUnion, 2009). This supervision triangle provides good training ground to build capacity to farmers in terms of contracts management.

The usual on-going trainings from planting to harvesting of the sugarcane crop are provided by stakeholders (the sugar millers) as part of their commitment. The farmers at this stage are linked actively with the sugar industry to carryout most of the agronomic day-to-day practices. These services embrace areas such as irrigation water management practices, good agronomic practices and farm business management. According to Bembridge (2000) weak support services are a recurrent theme in most smallholder irrigation scheme assessments. Therefore, there is general agreement that human and social capacity development among smallholder irrigators is a pre-condition for turning the current ‘downward ratchet’ trajectory of schemes into an upward one (Shah et al., 2002). Training of farmers and their collectives is needed in the domains of farm and scheme management. A new farm management model is being developed where the the smaller farmers’ associations can contract a professional farm manager to be paid directly from the growers’ gross revenues through a mechanism that is still under discussion. Social projects such as water and sanitation (WATSAN) project, and leadership capacity building projects are also implemented for the benefit of the community members. The WATSAN project is facilitated to improve the public health project in particular through provision of clean water to the farmers and the improvement of hygiene standards to reduce diseases within the communities.

The outcome of this phase is sustainable community-based irrigation schemes that have knowledge and skills to efficiently run their businesses using both traditional and modern approaches in development. All this is achieved in cooperation with the local stakeholders and with the component of capacity building of the local partners according to the needs that might arise.

7. Conclusions

In Swaziland, and probably also in the Southern Africa region, water has enabled many communities to improve their livelihoods by commercializing the smallholder irrigation sector. However, such large-scale smallholder projects require significant funds for the construction of water infrastructures and financing the in-field development. Many international project financiers now need greater levels of assurance that such capital intensive projects will have less risk of failure as a result of community conflicts and as well poor project planning and execution. The CDAA framework presented in this paper is a promising tool towards sustainable community development. The CDAA approach, being bottom-up in nature is more ideal for sustainable development. It plays a paramount role in ensuring that the community takes a leading role in ensuring that their aspirations come to fruition. The tool also gives the community members an opportunity to shape their own destiny, and can be applied

in planning and executing other community development initiatives. However, the LUSIP project is still in its maturing stage and so is the framework. It is therefore suggested that the framework in this paper be used as a baseline for implementing similar community irrigation projects in similar environments. Finally, it must be noted that its applicability may differ from one community to another and adjustment may be required to suit a particular community.

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